

CASE HISTORY

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IMPROVEMENT OF SAND AFFECTED SINDKHEDA - VARSHI ROAD MDR-17 KM 12/100 TO 13/800, SINDKHEDA, DHULE, MAHARASHTRA DHULE, MAHARASHTRA, INDIA



Soil Stabilisation

Client:	Products used:
PUBLIC WORKS DEPARTMENT, MAHARASHTRA	TECHCELL - 356X150
Main contractor:	Quantity supplied:
KRISHNA ENTERPRISES	
Manufacturer & Supplier:	Year of construction:
TECHFAB (INDIA) INDUSTRIES LTD.	

Project brief:

Shindkhede is a taluka in Dhule district of Maharashtra. It is located 43km towards north from district head quarters Dhule. Major district roads are used for both transportation of goods/commodities and passengers. Project starts from Sindkheda goes through Varshi & Kamkheda with total project length of 1.75 Km.

Problem:

MDR -17 is one of the busiest MDR in Maharashtra. There is constant vehicular traffic from Mumbai Agra highway –NH 52 as well as sand trucks which are coming from Tapi River. Truck loads of sand are loaded with wet sand which is constantly dripping water from these sand trucks and truck can weigh up to 60 tones. Continuous dripping water on road makes road surface vulnerable to failure under heavy traffic load and improper drainage was making it worse during rainy season.

Water induced distress may manifest through one of the following phenomenon:

1. Localized wet softened areas of pavement materials which could lead to formation of potholes in the pavement surface.
2. Localized upward heaving of pavement surface with separation and disintegration of various pavement layers
3. Unevenness or undulations of pavement surface.

In this case, all effects can be seen together. This water induced problem required prompt correction, because pavement deterioration in the form of potholes and surface disintegration was occurring at accelerated pace under heavy moving traffic. Surface treatment or additional overlay could not eliminate the problem.



Existing road condition

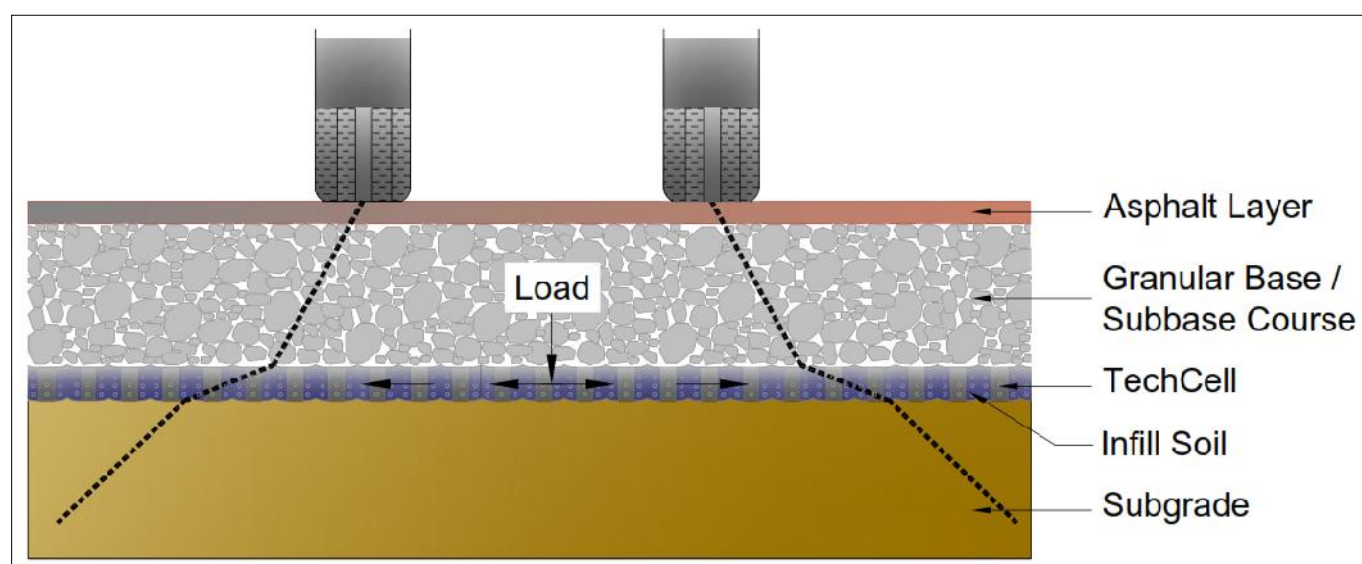
It is very important to provide cost effective and long lasting solution with minimum maintenance of pavement. The only logical solution was to remove all damaged layers and redo all damaged layers with geosynthetics and provide proper drainage system.

Solution:

Being busiest road, Construction work of road needs to be completed in a short time and this was big challenge .With use of geosynthetics both can be achieved as it is easy to install allows fast construction as well as strengthens so that future maintenance cost will be reduced.

So based on detailed investigation of the site by PWD (Maharashtra), Contractor suggested to use Techcell (Geocell) in GSB layer for strengthening of pavement and camber check during construction so that surface drainage will be smooth.

Techfab India recommended, following section.



Schematic Load Transfer through Techcell

Why Techcell was suggested for this project?

Techcell is the 3D-Honeycomb like cellular confinement system made with HDPE strips that are expandable on site to honeycomb like structure. When Techcell is filled in with GSB material to form compacted section with confinement system will increase the shear strength of the confined soil, and increase load carrying capacity. With the infill granular material and holes in Techcell wall, it enhances drainage and releases pore water pressure.

Techcell enables use of local non-cohesive fill, granular soil instead of expensive base layer aggregate. This lowers initial cost as well as the environmental impact of importing aggregates.

Techcell is easy to install, reduced infill requirements and extended life span result in saving in time, equipment, manpower and cost during construction, while structure that last longer and require less operating and maintenance cost over the project life span.



Sub-Grade compaction in progress



Techcell laying in progress



Laying of GSB in progress



Watering of GSB layer

As per design once compaction of sub grade is completed then Techcell was laid on top of subgrade. Techcell was expanded and fixed with steel bars on both ends so that it retains honeycomb shape. Techcell was filled with GSB material both by machines and manually. Then it was compacted followed by watering and once again compacted.



Visit by VAQC Team



Gradation Test of GSB on site

Authorities from VAQC visited the site for inspection, gradation GSB was conducted by authorities which fulfilled requirement as per MORTH 400.1 (infill material). We got approval for proceeding Construction work.

Compaction of GSB layer was carried out in parts once fully compacted as per requirement then Laying of asphalt layer was conducted. The project was successfully completed in Feb 2018 and PWD authorities were satisfied with the work.

About Techcell

Techcell is the 3D-Honeycomb like cellular confinement system created, manufactured and distributed by TECH-FAB INDIA Industries Ltd made from High Density Polyethylene stabilized with carbon black which has higher tensile strength and stiffness. Techcell is more durable over time and is available in different size depending upon weld spacing of cell available in various depths.

Applications

- Roadways
- Railways
- Steep soil reinforcement
- Reservoir
- Landfill areas
- Channel protection

Advantages

- It is easy to install in any weather.
- It does not require skilled labor for installation.
- It is an effective ground improvement solution for weak soils.
- It allows reduction in granular sub base layer

About Techfab India Industries Ltd

TechFab India was founded in 2003, with the objective of providing world class geosynthetic products and services to enable owners, consultants and contractors to design and implement reliable, economic and easy to construct solutions for a wide range of geotechnical, transportation, hydraulic and environmental related problems.

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